USACHPPM
Readiness thru Health
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Just the Facts...

Western Equine Encephalitis

- Western equine encephalitis is a viral disease that is spread by infected mosquitoes.
- It is one of several mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and death.
- Western equine encephalitis is found mainly in the plains regions of the western and central United States.
- There is no specific treatment for western equine encephalitis.
- Prevention centers on controlling mosquitoes and avoiding mosquito bites.

What is western equine encephalitis?
Western equine encephalitis is a disease that is spread to horses and humans by infected mosquitoes. It is one of a group of mosquito-borne virus diseases that can affect the central nervous system and cause severe complications and even death. Other similar diseases are eastern equine encephalitis, St. Louis encephalitis, and LaCrosse encephalitis.

What is the infectious agent that causes western equine encephalitis?
Western equine encephalitis is caused by the western equine encephalitis virus, an arbovirus. Arbovirus is short for **ar**thropod-**bo**rne **virus**. Arboviruses are a large group of viruses that are spread by certain invertebrate animals, mainly blood-sucking insects. In the United States, arboviruses are usually spread by infected mosquitoes. Birds are often the source of infection for mosquitoes, which can sometimes spread the infection to horses, other animals, and, in rare cases, people.

Where is western equine encephalitis found?
Western equine encephalitis is found in North, Central, and South America, but most cases have been reported from the plains regions of the western and central United States.

How do people get western equine encephalitis?
The virus that causes western equine encephalitis has a complex life cycle involving birds and a specific type of mosquito, *Culex tarsalis*, that is common in farming areas and around irrigated fields. Humans, horses, and other mammals are not an important part of the life cycle of the virus. In rare cases, however, people who live in or visit an area where the virus lives can be infected by the bite of an infected mosquito. Horses are common in these regions and can also be infected. After infection, the virus invades the central nervous system, including the spinal cord and brain.

What are the signs and symptoms of western equine encephalitis?
Infection can cause a range of illnesses, from no symptoms to fatal disease. People with mild illness often have only a headache and sometimes fever. People with more severe disease can have sudden high fever, headache, drowsiness, irritability, nausea, and vomiting, followed by confusion, weakness, and coma. Young infants often suffer seizures.

How soon after exposure do symptoms appear?
Symptoms usually appear in 5 to 10 days after the bite of an infected mosquito.

How is western equine encephalitis diagnosed?
Diagnosis is based on tests of blood or spinal fluid.

Who is at risk for western equine encephalitis?
Anyone can get western equine encephalitis, but some people are at increased risk:

- People living in or visiting areas where the disease is common
- People who work outside or participate in outdoor recreational activities in areas where the disease is common

Western equine encephalitis occurs in all age groups.

What complications can result from western equine encephalitis?
Major complications, including brain damage, are reported in about 13% of infected persons overall and in

about a third of infants. The disease is fatal to about 3% of persons who develop severe symptoms.

What is the treatment for western equine encephalitis?
There is no specific treatment for western equine encephalitis. Antibiotics are not effective against viruses, and no effective anti-viral drugs have been discovered.

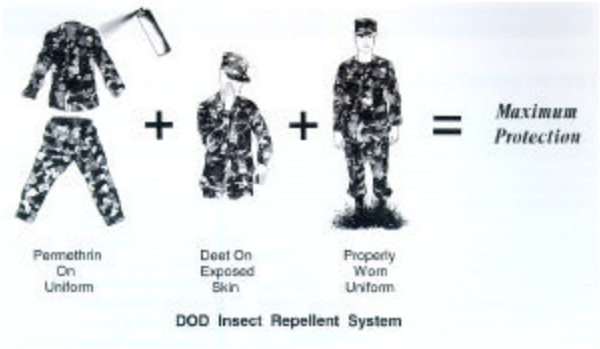
Patient care centers on treatment of symptoms and complications.

How common is western equine encephalitis?
Western equine encephalitis is a relatively rare disease in humans that can occur in isolated cases or in epidemics. Since 1964, 639 human cases have been confirmed in the United States. Fewer than 5 cases are reported each year. In the United States, cases in humans are usually first seen in June or July.

Is western equine encephalitis an emerging infectious disease?
Yes. Western equine encephalitis was first isolated in the United States in 1930. In 1941, a U.S. epidemic involved 300,000 horses and 3,340 humans. Since then, occasional smaller epidemics have occurred. The risk of exposure has been increasing in recent years as people move into previously undeveloped areas where the virus lives. Expansion of irrigated agriculture in the North Platte River Valley during the past several decades has created habitats and conditions that favor increases in the number of grain-eating birds and mosquitoes that spread western equine encephalitis.

How can western equine encephalitis be prevented?
A vaccine is available for horses but not for humans. Prevention centers on public health action to control mosquitoes and on individual action to avoid mosquito bites. To avoid being bitten by the mosquitoes that cause western equine encephalitis:

- Use mosquito repellents on skin and clothing
- Use insect repellents that have been approved by the Environmental Protection Agency (EPA). They are safe and effective.
- For your skin, use a product that contains 20-50% **DEET** (N<N-diethyl-meta-toluamide). **DEET** in higher concentrations is no more effective. Do not use **DEET** on infants (children under 3 years old).
- Use **DEET** sparingly on children, and don't apply to their hands, which they often place in their mouths.
- Apply **DEET** lightly and evenly to exposed skin; do not use underneath clothing. Avoid contact with eyes, lips, and broken irritated skin.
- To apply to your face, first dispense a small amount of **DEET** onto your hands and then carefully spread a thin layer.
- Do not inhale aerosol formulations.
- Wash **DEET** off when exposure to mosquitoes ceases.
- For your clothing, use an insect repellent spray to help prevent bites through the fabric. Use a product that contains either **permethrin** or **DEET**. **Permethrin** is available commercially as 0.5% spray formulations.
- **Permethrin** should only be used on clothing; never on skin.
- When using any insect repellent, always FOLLOW LABEL DIRECTIONS.
- For optimum protection, soldiers should utilize the **DOD INSECT REPELLENT SYSTEM**. In addition to proper wear of the battle dress uniform (BDUs), which provides a physical barrier to insects, this system includes the concurrent use of both skin and clothing repellents:



Standard military skin repellent: 33% **DEET**, long-acting formulation, one application lasts up to 12 hours, **NSN 6840-01-284-3982**. Standard military clothing repellents, either: aerosol spray, 0.5% **permethrin**, one application lasts through 5-6 washes **NSN 6840-01-278-1336**; or impregnation kit, 40% **permethrin**, one application lasts the life of the uniform, **NSN 6840-01-345-0237**. Factory repellent-treated BDUs are also available through the military supply system.

Where can I get more information on Western Equine Encephalitis and other forms of mosquito-borne viral encephalitis?
Contact the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), Aberdeen Proving Ground, Maryland 21010-5403: DSN 584-3613; CM (410) 436-3613; FAX –2037; or visit our website at: http://chppm-www.apgea.army.mil/ento. Additional information can also be obtained from your local, county or state health departments, your health care provider or by contacting the CDC email: dvbid@cdc.gov, or visit their website http://www.cdc.gov/ncidod/dvbid/arbor/arboinfo.htm.

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